

Name \_\_\_\_\_

Math 1

Exam 5

For all problems, show all work. You may use a graphing calculator. Do not round unless instructed otherwise. Good luck! ☺

For the first three problems, refer to the following information:

A young boy named Ralphie takes a bath in a tub that can hold up to 50 gallons of water. He plugs the drain, runs some water, gets into the tub, and starts playing with his rubber duckies. (He pretends that they have a duck fight, and “Quacker” wins as always.) After he is all done playing, Ralphie actually takes a bath, washing himself thoroughly. Once Ralphie is all done with his bath, he drains the water from the tub.

1. (1B, 5B, 5C, 5G) Draw a graph of a function that corresponds to this scenario. Be sure to label axes appropriately, include units, and supply scales. You need not try to determine formulas for any component of the graph.

2. (5A) Determine a suitable domain and range for the function.

3. (C3, 1E, 5A) Estimate the interval(s) on which your graph is decreasing. Explain why your graph is decreasing on each interval.

For the next five problems, refer to the following graphs:

4. (C3, 5A, 5D) Two of these functions have the same domain. Which two functions are they? Explain how you can tell.

5. (C3, 5A, 5D) Two of these functions have the same range. Which two functions are they? Explain how you can tell.

6. (1E, 5D) Determine at least one interval on which  $g(x) > f(x)$ .

7. (5B, 5E, 5F) Sketch a graph of the function  $k$  defined by  $k(x) = g(x) + h(x)$ .  
(Note that  $k$  is only defined for values of  $x$  for which *both*  $g(x)$  and  $h(x)$  exist.)

8. (5C, 5F) Express the function  $k$  from the previous problem in any format except for a graph.